

JOTTINGS FROM THE BIOLOGICAL LABORATORY
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4. AN AUSTRALIAN SPECIES OF *Bonellia*.

About a year ago Dr. R. von Lendenfeld and myself discovered on the shores of Neutral Bay, Port Jackson, several specimens of a species of *Bonellia*. Instead of inhabiting, like its European congener, narrow fissures in rocks, from which the soft-bodied animal can only be extracted entire by the exercise of extreme care, these species were found under small stones just about the limit of low water. I had on numerous occasions previously gone over the very same ground on the out look for various invertebrates without ever having seen a trace of this remarkable creature; and Dr. Lendenfeld informs me that he has very frequently visited the same spot since, and has hunted carefully for the *Bonellia*, but has never found any. A few weeks ago, however, on revisiting the spot I found several specimens apparently under the very same stones.

On a careful comparison of the specimens with a specimen of *Bonellia vividis* from Naples in the type collection of the University, and with the description and figures of Lucaze-Duthiers (1), I can find nothing in the external appearance—the colour, form of the body, shape and size of the bifurcated tentacle—to distinguish the Australian species from the European one, and the same result follows an examination of most of the internal organs: the alimentary canal, branched appendages and the nervous

(1) "Recherches sur la Bonellie," Ann. Sc. Nat., 1858.

system coincide exactly. In the reproductive organs there are certain differences ; but as none of my specimens had the ovaries ripe it will be necessary to obtain further material before coming to a decision on this point.

5. "AQUATIC RESPIRATION" IN FRESH WATER TURTLES.

Simon H. Gage (1) announced in 1883, that he had observed the Soft-Shellcd Turtle of the United States (*Aspidoonectes spinifer*), to be in the habit, when lying at the bottom of a tank, of taking water into the pharynx and expelling it again at regular intervals. The very same process takes place in the common Australian Long-Necked Fresh-Water Turtle (*Chelodina longicollis*) which has recently been figured and re-described by McCoy. (2) At more or less regular intervals the floor of the mouth is depressed, exactly, as remarked by Gage, by the same movement as that observed in the Frog in breathing air ; the loose walls of the pharynx swell out, and after a short interval the hyoid bone and the floor of the buccal chamber are raised again. A careful observation showed that these movements are accompanied by the alternate inhalation and exhalation of a considerable volume of water as evidenced by the movements of floating particles, and the question at once arises—Is this a form of auxiliary respiration by means of which the blood of the reptile is aerated during its prolonged immersions in pursuit of food ? In the case of the American species Gage answers this question in the affirmative, and bases his conclusion mainly on the presence, as observed by Agassiz, of a series of papillæ on the walls of the pharynx, and on the relatively small lung-capacity of the species.

Neither of these conditions hold good in the case of the Australian species. The pharynx is lined by a perfectly smooth mucous membrane which is not in any high degree vascular, and is clothed with a fairly thick stratified epithelium : while the lungs

(1) "Proceedings of the American Association for the Advancement of Science," August, 1883. The communication is quoted in full by W. K. Parker. ("Mammalian Descent," pp. 56-58.)

(2) "Prodromus of the Zoology of Victoria."

are of enormous capacity, lining the whole of the dorsal aspect of the body-cavity, from the root of the neck to the root of the tail. That the phenomena described partake of the nature of a process of auxiliary respiration, seems, then, extremely improbable. An animal of such very moderate vital activity as a Chelonian, and with such a reservoir for oxygen as it possesses in its lungs, could only require such a special auxiliary respiratory process, were its periods of immersion extremely prolonged. All Chelonians breathe with great slowness and will bear deprivation of oxygen for a very long time without injury. I am therefore induced to regard this inhalation and exhalation of water as having no functional importance, but rather to be of the nature of slight spasmodic movements produced probably by the rhythmical action of the respiratory mechanism.